WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2003ID10B

Title: Improved Short Term Operational Streamflow Forecasting for Snow Melt Dominated Basins

Project Type: Research

Focus Categories: Surface Water, Water Quantity, Methods

Keywords: Streamflow, Forecasting, Snow Melt, Runoff, Remote Sensing

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Federal Funds Requested: $15000.00

Matching Funds: $ 32931.00

Congressional District: 1

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Abstract: Short-term streamflow forecasts are critical for responsive management of water resource systems,
which are designed and operated for the purposes of irrigation, flood control, recreation, and hydroelectric
power generation. Most of Idaho's precipitation is stored as snow at high elevations and contributes to streamflow during the spring season. Knowledge of the amount and rate of snowmelt is crucial for decision-makers in federal and state agencies, as well as Idaho citizens whose livelihoods are directly affected by water availability (for example, farmers and tourism operators). As the region's population increases, bringing more industry, there are ever-increasing demands on water resources.

The accurate prediction of snowmelt is currently limited by several factors, including the lack of surface observations at high elevations (both observations of snow characteristics and meteorological quantities) and the inability of mesoscale meteorological models to provide accurate short-term forecasts of meteorological forcings. In recent years, remote sensing observations have provided distribution information regarding snowcover and snow water equivalency (SWE); however, frequent cloudiness at high elevations results in these data only being available on an intermittent basis. Although the real-time

assimilation of these data into snowmelt models can be useful, most operational models are not capable of ingesting these data. Research models are capable of utilizing this information; however, most research models are too complex and require too many input variables to be feasible for operational use. There is a critical need for a modeling approach that utilizes information available from remotely sensed data and meteorological forecasts, yet is can be implemented by operational water resource managers.
